29 August 2017

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

RE: Docket No. 17-108, Restoring Internet Freedom, Reply Comments in response to
https://www.fcc.gov/ecfs/filing/1071761547058
Joint Comments of Internet Engineers, Pioneers, and Technologists on the Technical Flaws in the FCC's Notice of Proposed Rulemaking and the Need for the Light-Touch, Bright-Line Rules from the Open Internet Order

Dear Ms. Dortch:

This submission makes reply comments to the above filing organized by the Electronic Frontier Foundation (EFF). It will address some patently false claims by the EFF. It will illustrate some important points about the Internet and its evolution and why Title II is inappropriate for a dynamic system that continues to evolve; and that because economic and engineering concerns are intertwined, policy needs to be flexible to allow for the continued development and investment in network technologies. It will also enter some important empirical research into the record.

I am a Telecommunications and Internet expert. I gained this experience working as a Research Fellow (Oxford Brookes and London School of Economics), My background is in engineering (BSc, Diploma and MSc from Imperial College London) and Cisco certifications in network design and support. I have a wide technical experience in the telecommunications industry in the United Kingdom and the Netherlands. And currently I am a Visiting Scholar at Florida International University and Adjunct Professor at Syracuse University. Please note that the comments below reflect my academic and professional views. I write only on behalf, not for any co-authors or affiliates. I have not received financial compensation to prepare these comments.

Misleading information from EFF

EFF's letter is a waterfall of misleading information that ultimately puts business interests of dominant internet companies over that of consumer choice. Increasingly internet traffic is concentrated with just a few major companies. Netflix, Amazon, and Google (including YouTube) account for more than two-thirds of America's internet traffic, much of which is spent delivering video entertainment. These companies have a direct line to the home via broadband and, yet don't want to build this cost of traffic delivery into their highly lucrative business models. In a truly fair and efficient system, these large companies would pay some amount proportional to the traffic they deliver. But in reality, they do nothing of the sort. They use the pretense of net neutrality and Title II to enshrine regulation that would prevent a fair and efficient business model, offloading much of the costs that consumers bear today.

Net neutrality as it stands today – which means internet regulation under Title II of the Communications Act – is neutral in name only. It is not fair or efficient. Internet architecture is complex. In real terms, the internet is now the backbone of many industries and services that rely on connectivity to collect, deliver, and transport data in real time.

The 2015 Open Internet Order was wrongly focused on only one segment of this delivery, the so-called "last mile" networks which connect customers and are managed by traditional Internet Service Providers (ISPs). First, the major internet companies including Google have already built their own private networks, clouds, and content delivery networks that bypass regulators and their standards for non-discrimination. It is here, inside their own private networks, that these large internet companies can manage traffic in non-neutral ways to maximize efficiency and lower costs. As a result, they've become increasingly independent of the services of ISPs. So to argue Title II is a necessity to protect their bottom-lines—some of which are larger annually than entire U.S. cities like Chicago and Washington, D.C. This makes no sense.

Second, Title II is like putting an old engine in a new car. It was created in 1934 to oversee the telephone system of that era. Meanwhile, today's internet is constantly transforming, innovating, and introducing our world to concepts not even realized a few years ago. To to regulate it with a rule from nearly 80 years ago is hardly a sensible or logical policy framework.

Third, Title II advocates claim the current regulations protect against potential anticompetitive practices pursued by broadband providers including blocking and/or throttling of online content. However, the Federal Trade Commission (FTC) already has established antitrust regulations that would prevent and/or legally hold accountable these sorts of actions. In fact, the FTC's long history of competition enforcement is strong –particularly in the technology space. For example, its ongoing suit against Qualcomm shines an important public light on Qualcomm's alleged licensing abuses in the chipset space that will ensure all innovators can gain fair access to essential technologies. For decades, the FTC has proven itself to be the expert competition enforcement agency with a long track record of protecting consumer interests. Regarding the current Title II debate, this will not change.

Net neutrality is a concept that may have political potency, but it is far removed from the core issues of the internet. If Title II regulations continue to be enforced, a significant advantage will continue to be handed out to companies that already have a dominance in the distribution of content and services over the internet. We must encourage regulators to look at what matters and not to be duped by all the sensationalized hype.

EFF supports the 2015 Open Internet Order, claiming that the Internet is essentially the same thing as the telephone network. This cannot be believed; most Americans have ditched traditional telephone service whereas Internet communications are growing.

The Internet and its evolution

The history of the Internet is well documented and referenced by many practitioners and researchers over the years. However the principles of net neutrality applied to the cable/static/land/traditional telecom networks do not adjust from the engineering point of view to the goals and structure of today's mobile networks. Both landline and wireless networks serve to the same purpose but are intrinsically different in architecture design and transmission goals. Title II was made for a different time and different service, and it utterly inappropriate for today's array of networks.

We must not forget that the original Internet was a mesh of main nodes and networks that has grown in an organic manner, first for military research units, academic institutions, enthusiasts, and only later to other parts of civil society and businesses. In fact many networks joined those main nodes to extend their ability to communicate with other networks at will. For many years the Internet worked on the principles of best effort distribution of data, in other words working to deliver in real time information based on the best path (the less congested, less number of nodes, etc). Many early Internet protocols were specified to

do their work on those assumptions (e.g. Sendmail). These meshed networks were and are in principle heterogeneous in nature and characteristics, from their architecture purpose (e.g. links capacity, levels of security, protocols hierarchy etc), to their goals and purposes (e.g. intranets, e-government, banks nodes, etc) and in many cases the rules of governance established are loosely based on the principle of unrestricted traffic flow or to transfer all traffic without any consideration, assuming that traffic between networks at a node will be balanced (incoming traffic = outgoing traffic). Hence the need to create a payload in monetary terms for data transference.

The internet of today is different. Many of the data transmission protocols are demanding in terms of calibration and drop rates times of the internet protocol (IP) stack. There are issues arising from providing reliable services for demanding paying consumers, and not just free users of real time applications that require a certain quality of service. There is already an imbalance in the traffic distributed at nodes; some companies such as Google and Netflix flood networks, and there is no reciprocity in the traffic load transferred in the opposite direction. Also security requirements are rising due to constant breaches of privacy and security of network devices, user profiles, companies' databases etc.

Mobile networks are different. These networks have been designed to follow a specific hierarchical architecture to optimize wave distribution of loads. These networks have been designed to integrate with the fixed internet but while data is in the waves, the rules to follow are the ones that optimize the network distribution. The technology is also different. Mobile networks join or connect to other networks with specific setting for calibration of performance, requirements that are unique to protect the network transmission properties.

Mobile networks were not designed for universal access. There is a dichotomy of the fact that mobile networks have less overhead than the fixed internet to be deployed in areas where a mobile phone can be the cheapest way to access the internet. However there is a cost to establish such connections that needs to be covered by the provider. Universal access can be provided over mobile networks but it cannot be free, nor can it can be assumed that such proposal will naturally provide the resources to maintain and expand the mobile network, especially as traffic demand is growing.

It is even more worrying that *universality* – what is common – is confused with *ubiquity* – what is available everywhere – when it comes to applying net neutrality rules, which aim to give a homogenous set of rules to a heterogeneous set of networks. In the case of mobile networks, and to a certain extent in the case of the fixed internet, the correspondence between territorial policy or jurisdiction, the actual technology requirements and the consumer needs are not properly weighed with the policy making.

For most of the unconnected, their first and likely only experience of the Internet will be over a mobile device. There is huge human capital of innovation to be tapped from the sharing experience of the internet with these new users. It is thus important to underscore that Open Internet rules be designed in such a way that they do not delay or inhibit the process for new users to get online.

One of the main arguments to stimulate mobile innovation is its potential with relative smaller – in comparison to other economic activities – investment to develop opportunities for enterprises of any size and the creation of jobs. Many countries see opportunities for the development of a digital economy that provides for local needs and perhaps global needs. We have examples of such drive in many places of the world, from state sponsored incubators to private initiatives such as Wayra, etc.

It is a recursive question to think that mobile applications development will inhibit universal access, since for any present and future developer access to the internet is critical in developing their ideas and contributing to the pool of digital innovation.

Economic and engineering concerns are intertwined

The EFF letter fails to mention some important facts.

- Trust and word of mouth characterized the working relationship between Internet engineers engaged in the original trade of Border Gateway Protocol (**BGP**). Regulation will only entwine current working practices that so far have been resilient and trustworthy enough to allow the Internet expansion and development.

- Considering the date of transformation of Arpanet was 1969, there was no Title II regulation for 46 years of the internet's life. There was not something radically different in 2015 that necessitated the FCC to impose regulation from 1934 onto the Internet.

- However a major transformation of the Internet has occurred in the last 20 years. What was originally a network of universities and research has been transformed in the backbone of the digital economy. Such a transformative change of a massive scale would require Congress to weigh in. The last time Congress made a pronouncement was in 1996 in Section 230 of the Telecommunications Act, in which they wrote that the policy of the United States "to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation."[1] It the role of Congress to instruct the FCC on whether and how to regulate the Internet.

- A huge concentration of power has grown in the hands of a few internet companies which have taken advantage of the dynamic innovation driven by the use of internet.

- Internet backbone networks overlap phone and fiber networks and have a cost of deployment, maintenance, and upgrade. The Title II regimes with price controls in favor of edge providers put the burden of cost on end users and don't allow the market to work flexibly. There is no logic to why end users should bear the full cost.

Some other observations

- No internet company has been able to successfully replace telecom operators or ISPs on a state or national rollback of infrastructure. Google fiber is a good example. So why do those so-called Internet companies do not provide a sensible proposal on how the next generation of technology will be paid and by whom?

- It is paradoxical that the network engineers calling for a "the internet free and accessible to all," call for regulation that is essentially about control by a political agent. This creates a dangerous precedent of having such control in countries like China, Iran, and North Korea. It is discouraging to follow such path, due to the violations of privacy and citizenships rights enable by technology surveillance.

- Motivations to sign the EFF letter likely come from huge internet industry pressure by some particular players that benefit significantly with the low power the FCC has to arbitrage issues of

[1] 47 USC § 230(b)(1).

consumer protection that will and can receive stronger monitoring in the hands of the FTC. This is extremely relevant with the raise of IoT devices and the services proposed that are positioned at the core of individuals and household activities.

The 2015 Order was a step in the wrong direction, regulating a vibrant space with rules designed for a government monopoly. There are many economic, political, and cultural to centralize bureaucratic power over the Internet in the hands of a politically appointed commissioners.

The FCC's step into Title II has opened a Pandora's box of problems, especially the removing online privacy protection from end users. The FCC usurped the jurisdiction of the FTC without the legislative mandate or the expertise and has put users at risk. It was a reckless maneuver which illustrates that the 2015 FCC was hell-bent on political power, not securing the interests of users. Moreover, the move reduced competition in the online advertising marketplace by raising the entry barrier for ISPs to compete. It also reduced parameters (e.g. arbitrarily raising the definition of broadband) on which ISPs could offer their services, which is itself an anti-competitive and harmful to consumers.

In point of fact existing competition and consumer protection laws at state and federal level already guarded against the harms described by net neutrality proponents, namely the blocking and throttling of content and discriminatory pricing. But the 2015 FCC's rules made broadband a common carriage service under Title II of the Communications Ac and thereby removed many layers of federal and state control by the Federal Trade Commission, Department of Justice, and State Attorney Generals. It put broadband purely in the domain of one agency, which is highly subject to political capture with five commissioners appointed by the President.

Network engineers will continue deploying and maintaining networks as long as they are affordable by network owners. It is in the interest of all to provide an economic framework where not only suppliers of content but network owners and consumer benefit.

Broadband Internet access is inherently an interstate service that should be subject to a single, national policy/regulatory framework under Title I of the Communications Act until Congress decides to define it otherwise.

Empirical Information

Enclosed are some valuable papers to illustrate the points made in this comment. For example:

2017 Liebenau, Jonathan, Elaluf-Calderwood, Silvia, Rossi, Enrico . "Changing Markets in Operating Systems; a socio-economic analysis". Abstract submitted for TPRC 2017. Accepted for presentation in September. George Mason University, Virginia, USA.

2016 Layton, Roslyn and Elaluf-Calderwood, Silvia "The Role of the Facebook's Free Basics Platform in Promoting Social Benefit Applications and Creating Price and Service Competition in the Market for Mobile Services. Case Studies from Latin America, Africa, and Asia". Paper accepted for the next TPRC conference in September. Abstract at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2757384

2015 Layton, Roslyn and Elaluf-Calderwood, S Zero Rating: Do Hard Rules Protect or Harm Consumers and Competition? Evidence from Chile, Netherlands and Slovenia . The 43st TPRC Conference, to be presented in September 2015.Arlington. Virginia. USA. http://ssrn.com/abstract=2587542.

2015 Hallingby, Hanne-S, Hartviksen, G, Elaluf-Calderwood, S and Sorensen, C. Converge in Action: A case study of the Norwegian Internet. Journal of Telematics and Informatics. Published online on the 28th August 2015. Available at http://www.sciencedirect.com/science/article/pii/S0736585315001100

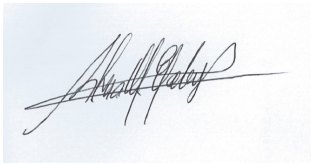
2012 Liebenau, J., S. Elaluf-Calderwood, and Karrberg, P "Strategic Challenges for the European Telecom Sector: The Consequences of Imbalances in Internet Traffic." Journal of Information Policy 2: 248-272. Accessible at: http://jip.vmhost.psu.edu/ojs/index.php/jip

EFF can offer no empirical evidence that bright line rules are necessary. However there is significant evidence that bright lines rules are harmful. I attach a summary of recent research investigating the outcome of bright line rules in a number of countries.

Layton, Roslyn. “Does Net Neutrality Spur Innovation?” American Enterprise Institute. August 2015. http://www.aei.org/publication/does-net-neutrality-spur-internet-innovation/

Thank you for your attention. Please feel free to contact me with any questions.

Sincerely,



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